

THAT WHICH IS CLAIMED:

1. A process for producing spunbond nonwoven fabric, comprising the steps of:

5 separately melting two or more polymeric components;

separately directing the two or more molten polymer components through a spin beam assembly equipped with a distribution plate configured so that the separate molten polymer components combine at a multiplicity of spinnerette orifices to form filaments containing the two or more polymer components;

10 extruding the multicomponent filaments from the spinnerette orifices into a quench chamber;

directing quench air from a first independently controllable blower into the quench chamber and into contact with the filaments to cool and solidify the filaments;

15 directing the filaments and the quench air into and through a filament attenuator and pneumatically attenuating and stretching the filaments;

directing the filaments from the attenuator into and through a filament depositing unit;

20 depositing the filaments from the depositing unit randomly upon a moving continuous air-permeable belt to form a nonwoven web of substantially continuous filaments;

applying suction from a second independently controllable blower beneath the air-permeable belt so as to draw air through the depositing unit and through the air-permeable belt; and

25 directing the web through a bonder and bonding the filaments to convert the web into a coherent nonwoven fabric.

2. The process according to Claim 1, wherein the two or more polymer components are arranged in a cross-sectional configuration selected from sheath core, side by side, segmented pie, islands-in-the-sea, or tipped profile.

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3. The process according to Claim 1, wherein one polymer component is polyethylene and another polymer component is polypropylene.

4. The process according to Claim 1, wherein two polymer component are directed through the spin beam assembly and are combined at the spinnerette orifices to (firm) sheath-core bicomponent filaments, and wherein one of the polymer components is polypropylene and the other polymer component is a polymer having different properties from said polypropylene polymer component.

5. The process according to Claim 1, wherein said extruding step comprises extruding the filaments through spinnerette orifices arranged at a density of at least 3000 orifices per meter.

6. A process for producing a spunbond nonwoven fabric, comprising the steps of:

separately melting first and second polymeric components;

separately directing the first and second molten polymer components through a spin beam assembly equipped with distribution plate configured so that the separate molten polymer components combine at a multiplicity of spinnerette orifices to form bicomponent filaments containing a core of the first polymer component and a surrounding sheath of the second polymer component, the spinnerette orifices being arranged at a density of at least 3000 orifices per meter;

extruding the bicomponent filaments from the spinnerette orifices into a quench chamber;

directing quench air from a first independently controllable blower into the quench chamber and into contact with the filaments to cool and solidify the filaments;

directing the filaments and the quench air into and through a filament attenuator and pneumatically attenuating and stretching the filaments;

directing the filaments from the attenuator into and through a filament depositing unit;

depositing the filaments from the depositing unit randomly upon a moving continuous air-permeable belt to form a nonwoven web of substantially continuous filaments;

5 applying suction from a second independently controllable blower beneath the air-permeable belt so as to draw air through the depositing unit and through the air-permeable belt; and

directing the web through a bonder and bonding the filaments to convert the web into a coherent nonwoven fabric.

10 7. The process according to Claim 6, wherein the first polymer component is polypropylene and the second polymer component is polyethylene.

15 8. The process according to Claim 6, wherein the first polymer component is polypropylene and the second polymer component is a different polypropylene.

9. The process according to Claim 6, wherein the step of directing the web through a bonder comprises directing the web through a calender including a patterned calender roll and forming discrete point bonds throughout the fabric

20 10. A system for manufacturing spunbond nonwoven fabric which includes: two or more extruders for separately melting, respectively, two or more polymer components;

a spin beam assembly connected to said extruders for separately receiving the molten polymers components therefrom;

25 said spin beam assembly including a spinnerette plate defining a multiplicity of spinnerette orifices, and a distribution plate configured so that the separate molten polymer components combine at the spinnerette orifices to form multicomponent filaments;

30 a quench chamber positioned adjacent to the spin plate for receiving filaments extruded from the spinnerette orifices; and

a first independently controllable blower mounted for directing air into the quench chamber and into contact with the filaments to cool and solidify the filaments;

an attenuator positioned for receiving the filaments and the quench air and configured for pneumatically attenuating and stretching the filaments;

5 a filament depositing unit;

a moving continuous air-permeable belt positioned for having randomly deposited thereon the filaments from the depositing unit to form a nonwoven web of substantially continuous filaments;

10 a second independently controllable blower positioned beneath the air-permeable belt so as to draw air through the depositing unit and through the air-permeable belt; and

a bonder for bonding the filaments and to form therefrom a coherent nonwoven fabric.

11. The system according to Claim 10, wherein said distribution plate is
15 configured so that the separate molten polymer components combine in a cross-sectional configuration selected from sheath core, side by side, segmented pie, islands-in-the-sea, tipped profile.

12. The system according to Claim 10, wherein said spinnerette has orifices
20 arranged at a density of at least 3000 orifices per meter.

13. A system for manufacturing spunbond nonwoven fabric which includes:
first and second extruders for separately melting first and second polymer
components;

25 a spin beam assembly connected to said extruders for separately receiving the molten polymers components therefrom;

said spin beam assembly including a spinnerette plate defining a multiplicity of spinnerette orifices arranged at a density of at least 3000 orifices per meter, and a distribution plate configured so that the separate molten polymer components combine at
30 the spinnerette orifices to form bicomponent filaments having a core formed of the first polymer component and a surrounding sheath formed of the second polymer component;

a quench chamber positioned adjacent to the spin plate for receiving filaments extruded from the spinnerette orifices; and

a first independently controllable blower mounted for directing air into the quench chamber and into contact with the filaments to cool and solidify the filaments;

5 an attenuator positioned for receiving the filaments and the quench air and configured for pneumatically attenuating and stretching the filaments;

a filament depositing unit;

a moving continuous air-permeable belt positioned for having randomly deposited thereon the filaments from the depositing unit to form a nonwoven web of substantially
10 continuous filaments;

a second independently controllable blower positioned beneath the air-permeable belt so as to draw air through the depositing unit and through the air-permeable belt; and

a bonder for bonding the filaments and to form therefrom a coherent nonwoven fabric.
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14. The system according to Claim 13, wherein the first polymer component is polypropylene and the second polymer component is polyethylene.

15. The system according to Claim 13, wherein the first polymer component is
20 polypropylene and the second polymer component is a different polypropylene.

16. The system according to Claim 13, wherein the bonder comprises a calender including a patterned calender roll which forms discrete point bonds throughout the fabric.